

Answers

Q: 1. Number of compute nodes The specification refers to “6+ nodes” and “6 or more 1U rack servers”, while the required quantity is stated as 6. Please clarify whether the required quantity is exactly six compute nodes, or whether tenderers are permitted or expected to offer more than six nodes.

A: Tenderers are permitted to offer a minimum of 6, or more nodes.

Q: 2. CPU configuration The specification requires “dual-socket CPUs providing ≥ 32 physical cores total”. Please clarify whether this means that two physical CPUs must be installed in each server, or whether a server with two CPU sockets populated with a single CPU providing at least 32 physical cores is acceptable.

A: It is acceptable to have a dual-socket server with only 1 CPU ≥ 32 physical cores Or 2 CPU with ≥ 16 physical cores per cpu.

Q:3. CPU core definition Please clarify whether the requirement of “ ≥ 32 physical cores” refers to the total number of physical CPU cores installed in each server, excluding SMT/Hyper-Threading logical cores.

A: Physical cores refer to the total number of physical CPU cores installed in each server, excluding SMT/Hyper-Threading logical cores.

4. NVMe form factor The specification requires “ $\geq 2 \times$ U.2 NVMe SSDs”. Please clarify whether the U.2 form factor is mandatory, or whether an enterprise NVMe solution using another manufacturer-supported form factor/interface and providing equivalent or better performance, reliability and functionality would be considered compliant.

A: Any enterprise NVMe solution providing equivalent or better performance, reliability and functionality will be considered compliant.

5. NVMe capacity The specification requires “ ≥ 2 TB” NVMe SSDs. Please clarify whether enterprise NVMe SSDs with a nominal capacity of 1.92 TB, which is a standard enterprise SSD capacity class, would be considered compliant with the stated requirement.

A: 1.92TB enterprise capacity will be considered compliant with the stated requirements.

Q: 6. NVMe RAID1 implementation Please clarify whether a dedicated hardware RAID controller is mandatory for the NVMe RAID1 configuration, or whether any manufacturer-supported RAID1 implementation providing the required redundancy is acceptable.

A: Hardware RAID is not mandatory, manufacturer-supported RAID1 implementation providing the required redundancy is acceptable.

Q: 7. NVMe expansion The specification requires “expandable NVMe capacity”. Please clarify the minimum expansion capability expected, including whether a minimum number of additional/free NVMe drive bays or a minimum future NVMe capacity is required.

A: Minimum expansion capacity from 2 to 4 NVMe drives, more future NVMe capacity is preferred, not required.

Q: 8. 10 GbE interfaces The specification requires “ $\geq 2 \times 10$ GbE ports”. Please clarify whether these ports are required to be SFP+/optical interfaces, 10GBASE-T/RJ45 interfaces, or whether either technology is acceptable.

A: SFP+ or SFP28 optical interfaces are mandatory due to equipment already on site.

Q: 9. 10 GbE interconnection components If SFP+ connectivity is required, please clarify whether the necessary SFP+ transceivers, DAC/AOC cables and/or optical modules are required to be included in the offer. If so, please specify the required quantities and interface/cable types.

A: SFP+ transceivers, DAC/AOC cables and/or optical modules are required to be included in the offer, All components are required for a fully operational solution, even where their quantities are not specified.

Q: 10. Remote management licensing The specification requires remote management functionality equivalent to iLO/iDRAC. Please clarify whether an advanced/premium remote-management licence is required, or whether the manufacturer’s standard integrated remote-management functionality is sufficient, provided that all required management functions are available.

A: An advanced/premium remote-management licence is required.

Q: 11. Virtualisation platform compatibility The specification requires “full compatibility with modern virtualization platforms (Proxmox, ESXi, Hyper-V or equivalent)”. Please clarify whether formal manufacturer certification for any of the listed platforms is required, or whether technical compatibility with the stated virtualization platforms is sufficient.

A: Technical compatibility with the stated virtualization platforms is sufficient.

Q: 12. Memory expansion The specification requires ≥ 128 GB ECC RAM, expandable to 512 GB+. Please clarify whether the server must have sufficient free DIMM slots to reach at least 512 GB using supported memory modules, or whether the requirement can be fulfilled by replacing the initially installed DIMMs.

A: Fulfilled by replacing the initially installed DIMMs, will be acceptable.

Q: 13. Meaning of “dual-redundant” The storage system is described as a “Dual-redundant data storage”. Please clarify whether this specifically requires a dual-controller architecture with two redundant storage controllers and automatic failover, or whether another manufacturer-supported redundant architecture providing equivalent functionality is acceptable.

A: Another manufacturer-supported redundant architecture providing equivalent functionality is acceptable, Two independent storage systems with network replication are also acceptable. Dual power redundancy is mandatory in both cases.

Q: 14. Storage capacity – 150–250 TB The storage system is described as “150–250 TB”, while the detailed requirement specifies “ ≥ 150 TB raw capacity”. Please clarify whether 250 TB represents a maximum permitted raw capacity, or whether storage systems exceeding 250 TB raw capacity are also acceptable.

A: Storage systems exceeding 250TB Raw capacity are also acceptable

Q: 15. Raw versus usable capacity Please confirm that the minimum capacity requirement of ≥ 150 TB refers to raw physical capacity before RAID-6 or equivalent redundancy overhead, rather than usable capacity available to the hosts after RAID protection.

A: Usable capacity at least 150TB

Q: 16. Enterprise HDD definition The specification requires “Enterprise HDDs”. Please clarify the minimum required characteristics of the HDDs, including interface technology (e.g. SAS, NL-SAS or equivalent), rotational speed, minimum individual drive capacity and any other mandatory enterprise-class characteristics.

A: Any drive with NL-SAS, SAS or equivalent is acceptable, minimum 7200rpm, minimum 10TB per disk. Must be classed as enterprise by manufacturer.

Q: 17. Enterprise nearline drives Please clarify whether manufacturer-certified enterprise nearline HDDs intended for use in enterprise storage systems are acceptable for the required storage capacity.

A: Enterprise nearline drives are acceptable.

Q: 18. RAID-6 implementation The specification requires RAID-6 or an equivalent dual-drive-failure-tolerant setup. Please clarify whether any manufacturer-supported dual-drive-failure-tolerant storage architecture is acceptable, provided that it provides equivalent or better data protection and functionality.

A: Any manufacturer-supported dual-drive-failure-tolerant storage architecture is acceptable, provided that it provides equivalent or better data protection and functionality.

Q: 19. SSD/NVMe cache The specification requires “SSD/NVMe cache”. Please clarify whether this specifically requires dedicated SSD/NVMe cache drives, or whether an equivalent manufacturer-supported caching or storage-tiering architecture providing the required performance functionality is acceptable.

A: Requires dedicated SSD/NVMe cache drives. Read only cache is acceptable.

Q: 20. Cache capacity Please clarify whether a minimum SSD/NVMe cache capacity is required. If so, please specify the minimum required capacity and whether a distinction is made between read cache, write cache and storage tiering.

A: Atleast 500GB Read cache, more is preferred.

Q: 21. Storage connectivity protocol The specification requires “10/25/40 Gbps connectivity with multipathing”. Please clarify which host connectivity protocol is required, e.g. iSCSI/Ethernet, Fibre Channel, NVMe over Fabrics, or another protocol.

A: iSCSI/Ethernet is required for interoperability with existing equipment. NVMe over Fabrics is optional, Fibre Channel not preferred.

Q: 22. Connectivity speed Please clarify whether the storage system must support all three stated connectivity speeds (10, 25 and 40 Gbps), or whether support for at least one of these speeds is sufficient.

A: Support for at least 10Gbps is required, support for more speeds is preferred.

Q: 23. Storage host ports Please specify the minimum required number of host connectivity ports per storage controller, including the required number and type of ports for the intended multipathing configuration.

A: Minimum Ports per Controller: Two (2) physical ports.

Port Type: Ethernet ports. Protocol: iSCSI.

Multipathing Configuration: Active-Active or Active-Passive link failover via standard Ethernet multi-path I/O (MPIO) across a single-controller architecture.

Q: 24. Block storage versus file storage Please clarify whether the intended storage system is primarily required to provide block storage for the virtualization environment, or whether native NAS/file-storage functionality is also required.

A: Block storage and native NAS/file-storage is required.

Q: 25. File protocols If NAS/file-storage functionality is required, please specify the required file protocols, such as NFS and/or SMB, and any minimum functional or performance requirements.

A: NFS and SMB are required.

Q: 26. Snapshot licensing The specification requires snapshot functionality. Please clarify whether all licences required to provide snapshot functionality must be permanently included in the offered solution and covered for the entire required support period.

A: Snapshot licensing must be covered permanently.

Q: 27. Additional storage functionality licensing Please clarify whether all licences required for the specified storage functionality, including caching/tiering, multipathing, snapshots and expansion functionality where applicable, are expected to be included in the offered price for the entire required support period.

A: All licences required for the specified storage functionality must be included in the offered price for the entire required support period.

Q: 28. Storage expansion The specification requires “expansion support”. Please clarify whether this refers to additional drives within the base enclosure, additional expansion enclosures/shelves, or both.

A: Additional drives within the base enclosure are required, additional expansion enclosures/shelves are preferred.

Q: 29. Support period and service level The specification states “3–5 year support”. Please clarify the exact required support period and service level, including whether the requirement is for 3, 4 or 5 years and what response/replacement service level is expected.

A: Atleast 3 Year support,

SLA: 8x5 Technical Phone/Email Support.

Response / Replacement Time: Next Business Day (NBD) parts delivery and onsite engineering.

Q: 30. Support provider Please clarify whether the required support must be provided directly by the equipment manufacturer, or whether support provided by an authorised service organisation certified by the manufacturer is acceptable, provided that all manufacturer warranty and support requirements are maintained.

A: Support provided by an authorised service organisation certified by the manufacturer is acceptable, provided that all manufacturer warranty and support requirements are maintained.

Q: 31. 10 GbE and 40 GbE interfaces The specification requires $\geq 48 \times 10$ GbE ports and $\geq 4 \times 40$ GbE uplinks. Please clarify whether SFP+ interfaces are required for the 10 GbE ports and QSFP+ interfaces for the 40 GbE uplinks, or whether equivalent interface technologies are acceptable.

A: SFP+, SFP28, or SFP-DD form-factors are acceptable for the 10 GbE host ports. QSFP+, QSFP28, or QSFP-DD form-factors are acceptable for the 40 GbE uplinks.

Higher-specification interfaces (including Double Density variants) are explicitly allowed, provided they support backward compatibility to the requested 10 GbE / 40 GbE operating speeds using standard transceivers, direct-attach copper (DAC) cables, or appropriate manufacturer-supported breakout cables.

Q: 32. Transceivers and cabling Please clarify whether all transceivers, DAC/AOC cables, optical modules and other interconnection components required to connect the compute nodes, storage system and other required equipment are to be included in the offer. If so, please specify the required quantities, interface types and cable lengths.

A: All components that are required for a fully operational solution, even where their quantities are not specified. Minimum requirements 3 metres.

Q: 33. MLAG requirement The specification requires one network switch while also requiring MLAG for redundancy. Please clarify whether the supplied switch is expected to operate as part of an MLAG pair with an existing switch at the site, or whether only native MLAG capability is required.

A: Only native MLAG capability is required.

Q: 34. Existing switch interoperability If integration with an existing switch is required for MLAG or other redundancy functionality, please provide the manufacturer, model, software/firmware version and relevant interface/MLAG configuration of the existing switch.

A: No existing switch integration is required.

Q: 35. Network software licensing Please clarify whether all software licences required to provide the requested functionality, including MLAG, VLAN, LACP, QoS, SNMP monitoring and IPv4/IPv6 dual-stack functionality, must be included permanently in the offered switch configuration.

A: All software licenses must be included permanently in the offered switch configuration

Q: 36. Complete interconnection solution Please clarify whether all network and storage connectivity components required for a fully operational Lot 2 solution, including transceivers, DAC/AOC cables, optical modules, patch cables and other interconnection components, are required to be included in the offer even where their quantities are not explicitly stated in the Bill of Quantities/technical specification.

A: Yes, all components are required for a fully operational solution, even where their quantities are not specified.

Q: 37. Intended connectivity topology Could the Contracting Authority provide the intended connectivity topology between the six compute nodes, the storage system and the network switch, including the required number of physical links, interface types, redundancy/multipathing requirements and expected connection speeds?

A: Each compute and storage node must be equipped with a minimum of two (2) physical network interfaces

These interfaces must be configured in an Active-Active Link Aggregation (LACP / IEEE 802.3ad) mode.

Redundant network switches configured in an MLAG / stack architecture are preferred but not required

Q: 38. Existing infrastructure and interoperability Please clarify whether the equipment supplied under Lot 2 must interoperate with any existing server, storage, network, virtualization or management infrastructure at the NINET data centre. If so, please provide the relevant manufacturers, models, interface types and software/firmware versions.

A: Interoperability with current Proxmox Virtual Enviroment v9.2 cluster is preferred.